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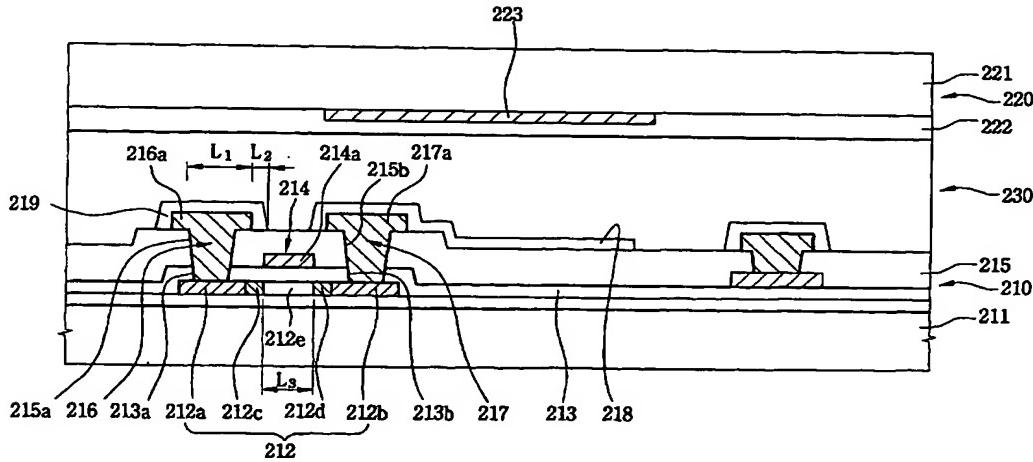
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GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG,
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(54) Title: DISPLAY PIXEL, DISPLAY APPARATUS HAVING AN IMAGE PIXEL AND METHOD OF MANUFACTURING DISPLAY DEVICE





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CLASSIFICATION OF SUBJECT MATTER

IPC⁷: H01L 21/285, H01L 29/786, G02F 1/136, G09G 3/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: G02F, G09G, H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, PAJ, WPI, English Fulltext

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X | US 5341012 (MISAWA, OSHIMA) 23 August 1994 (23.08.1994) <i>fig. 3B, fig. 4A-D, and description page 6, line 35 - page 9, line 7.</i> <i>esp. fig. 3B.</i> | 1,2,6 |
| Y | | 13-27 |
| A | <i>the whole document.</i> | 1-27 |
| X | US 2002 125477 A (WOO YOUNG et al.) 12 September 2002 (12.09.2002) <i>the abstract, description, fig. 2A-E, claims 1-18.</i> | 1-12 |
| Y | <i>the whole document.</i> | 13-27 |
| X | US 2002 158995 A (CHANG-WON et al.) 31 October 2002 (31.10.2002) <i>abstract, description, fig. 5A-E, claims 9,14-16,20,23.</i> | 1-12 |
| Y | <i>the whole document.</i> | 13-27 |
| X | JP 08 160464 (SANYO ELECTRIC CO) 21 June 1996 (21.06.1996) <i>abstract, fig. 3-8.</i> | 3,4 |

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|------------------------------------------------------------------------------------------------------------|-----------------------|
| X | JP 11 153812 (SHARP KK) 8 June 1999 (08.06.1999) <i>the whole document, esp. abstract and fig. 2.</i> | 1-12 |
| A | <i>the whole document.</i> | 13-27 |
| X,P | US 2003 122196 A (HAN-WOOK) 3 July 2003 (03.07.2003) <i>the whole document.</i> | 1,3-11 |
| A | <i>the whole document.</i> | 2,12-27 |
| X | US 5744824 (KOUSAi et al.) 28 April 1998 (28.04.1998) <i>the whole document esp. fig. 3A-G.</i> | 1,2,5-10,12 |
| X | US 5569610 (TAKEMURA et al.) 29 October 1996 (29.10.1996) <i>the whole document, esp. fig. 4A-E.</i> | 1-12 |
| | ---- | |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 03/02677-0

| Patent document cited in search report | | Publication date | Patent family member(s) | | Publication date |
|-------------------------------------------|----------------|---------------------|----------------------------|--------------|---------------------|
| JP A | 8160464A 2 | | none | | |
| JP A | 11153812 A2 | | none | | |
| US A | 20021254 77 | 2002-09-12 | US | B 6692997 | 2004-02-17 |
| | | | KR | A 2002071059 | 2002-09-12 |
| | | | JP | A 2002359375 | 2002-12-13 |
| US A | 20021589 95 | 2002-10-31 | KR | A 2002083401 | 2002-11-02 |
| | | | TW | B 490858 | 2002-06-11 |
| | | | JP | A 2002333641 | 2002-11-22 |
| | | | CN | A 1383214 | 2002-12-04 |
| US A | 20031221 96 | 2003-07-03 | KR | A 2003057074 | 2003-07-04 |
| | | | US | B 6713825 | 2004-03-30 |
| US A | 5341012 | | US | B 6700135 | 2004-03-02 |
| | | | US | A 2003010990 | 2003-01-16 |
| | | | US | B 6486497 | 2002-11-26 |
| | | | EP | A 1227469 | 2002-07-31 |
| | | | SG | A 81859 | 2001-07-24 |
| | | | SG | A 81185 | 2001-06-19 |
| US A | 5569610 | | US | B 6642073 | 2003-11-04 |
| | | | CN | A 1328340 | 2001-12-26 |
| | | | JP | A 2001267587 | 2001-09-28 |
| | | | JP | A 2001250961 | 2001-09-14 |
| | | | CN | A 1255733 | 2000-06-07 |
| | | | CN | A 1244039 | 2000-02-09 |